

CLAIMS

1. A bump inspection apparatus for inspecting shapes of a plurality of bumps each having a planar top portion, on an inspection object, comprising:

5 an illumination optical system for illuminating said top portions with a parallel pencil of light vertical thereto through a telecentric optical system;

10 an observation optical system comprising a telecentric optical system having an optical axis thereof in conformity with that of said illumination optical system;

15 an observation portion for observing the images of said top portions in a predetermined range of said inspection object through said observation optical system; and

a processor unit for analyzing the shapes of said bumps on the basis of the images of said top portions from said observation portion;

20 said processor unit including analyzing means for analyzing the area of said planar top portion of each of said bumps, and judging means for judging whether or not the area of said top portion falls within a predetermined range.

25 2. A bump inspection apparatus according to claim 1, wherein said top portions of all of said bumps of said inspection object exist on the same plane.

30 3. A bump inspection apparatus according to claim 2, wherein said bumps are formed into a substantially hemispherical shape by reflowing of solder, and said top portions of said bumps are shaped into a planar shape by a coining process.

35 4. A bump inspection method for inspecting shapes of a plurality of bumps each having a planar top portion, on an inspection object, comprising the steps of:

an illumination step of illuminating said top portions with a vertical parallel pencil of light

vertical thereto through a telecentric optical system;  
an observation step of observing by a  
telecentric optical system having an optical axis in  
conformity with that of said illumination optical system;

5 another observation step of observing the  
images of said top portions within a predetermined range  
of said inspection object through said observation  
optical system; and

10 a processing step of analyzing the shapes  
of said bumps on the basis of the images of said top  
portions by said observation portion;

said processing step including an  
analyzing stage of analyzing the areas of said planar top  
portions for said individual bumps and a judging stage of  
15 judging whether or not the areas of said top portions are  
within a predetermined range.

5. A bump inspection method according to claim 4,  
wherein said top portions of all of said bumps of said  
inspection object exist on the same plane.

20 6. A bump inspection method according to claim 5,  
wherein said bump is shaped into a substantially  
hemispherical shape by reflowing of solder, and said top  
portion is shaped into a planar shape by a coining  
processing.